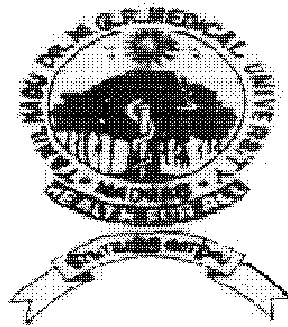


**“MANUAL VACUUM ASPIRATION VERSUS
CURETTAGE IN FIRST TRIMESTER INCOMPLETE
ABORTION”**

Dissertation submitted to
The Tamil Nadu Dr.M.G.R. Medical University
in partial fulfillment for the award of the Degree of

M.D. (OBSTETRICS AND GYNECOLOGY)
BRANCH-II



THE TAMIL NADU Dr.M.G.R.MEDICAL UNIVERSITY
INSTITUTE OF SOCIAL OBSTETRICS,
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MARCH 2012

BONAFIDE CERTIFICATE

This is to certify that this dissertation entitled **“MANUAL VACUUM ASPIRATION VERSUS CURETTAGE IN FIRST TRIMESTER INCOMPLETE ABORTION”** is the bonafide work done by **Dr. A. SWAPNA**, Post Graduate in obstetrics and gynecology under my over all supervision and guidance in the Institute of Social Obstetrics, Govt Kasturba Gandhi Hospital, Madras medical college Chennai, in partial fulfillment of the requirements of **The Tamil Nadu Dr. M.G.R. Medical University** for the award of **M.D DEGREE** in Obstetrics and Gynecology **BRANCH - II**.

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1. INTRODUCTION

Early miscarriage is a common experience for women and is responsible for the maximum number of pregnancy losses. Approximately one in four women will experience such a loss in her life time⁶. Local data shows an annual abortion rate of 3% in women aged between 15-49 years, in that incomplete and missed abortion being most common, occurs in approximately 15% of clinically recognized pregnancies in 8,90,000 women per year⁴.

While abortion is legally permitted in many countries, women continue to face profound barriers that restrict their access to safe abortion services and endanger their health. Lack of trained abortion providers, restrictions in service availability and high costs may all present obstacles too great for women to overcome in a timely manner.

Maternal deaths due to unsafe abortion are around 10-13% in developing countries. Hence a method which is safe and cost effective has to be found. At present vacuum aspiration, sharp curettage, medical evacuation with misoprostol and expectant management are the available methods. Vacuum aspiration has come up as the most widely used method due to its safety and being less painful than dilatation and curettage (D&C) and medical methods. A high efficacy of vacuum

aspiration with success rate between 95-100% has been reported in various trials of study in vacuum aspiration.

MVA is being used since 1973 with good safety and efficacy reports around the world. Its use has been extended for the management of missed miscarriage and molar pregnancy.

Manual vacuum aspiration (MVA) can offer health care systems a safe, accessible, and affordable way to provide abortion and overcome barriers that inhibit women's ability to access services. MVA has several benefits that make it a worthwhile component of abortion services. Compared to dilatation and curettage (D&C), MVA is a potentially less expensive way to offer a high-quality service to women throughout the world. Other methods are usually only done by doctors in medical centers, but MVA can be done by paramedics. If midwives and others learn to use MVA safely, more women, especially poor women and women who live in villages far from medical care will have access to safe abortions and to life-saving care after incomplete miscarriage and MTP.

2. OVERVIEW

INCIDENCE

It is difficult to assess accurately the incidence of abortion, since many illegally induced abortions are not reported. Some very early abortion usually resemble delayed period. 10% of all pregnancy end in spontaneous abortion and another 10% are induced illegally. 75% of abortion occur before 16th week of pregnancy, of which 75% occur before the 8th week of pregnancy³.

MECHANISM OF ABORTION

Almost 80% of diagnosed abortions occur before the second trimester of pregnancy.

Before 8 weeks: The pregnancy sac is extruded from the uterus in en mass.

8-14 weeks: Expulsion of the fetus commonly occurs leaving behind the placenta and membranes causing brisk haemorrhage.

Beyond 14 weeks: After that time the process resembles that of a labour in that, the membranes rupture at some stage during dilatation of

cervix and the fetus and placenta born separately. As the uterus is not properly sensitized and its muscular action is less efficient, some part of the chorion is therefore often retained and excessive haemorrhage is common.

PATHOLOGY OF ABORTION

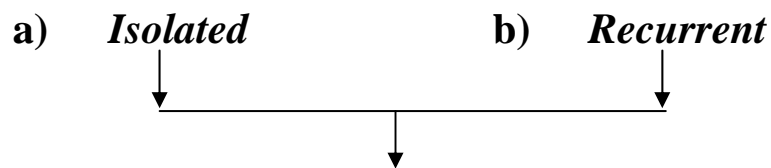
Haemorrhage into deciduas basalis and necrotic changes in the tissue adjacent usually accompany abortion. The ovum becomes detached and stimulates uterine contractions that result in expulsion. When the sac is opened, fluid is commonly found surrounding a small macerated fetus or alternatively, there may be no visible fetus in the sac, the so called *blighted ovum*.

Blood or carneous mole is an ovum that is surrounded by a capsule of clotted blood. The small fluid containing cavity within appears compressed by thick walls of old blood clot. The retained fetus may undergo maceration. The bones of skull collapse and the abdomen becomes, distended with bloodstained fluid. The skin softens and peels off in utero. Internal organs degenerate and undergo necrosis. Amniotic fluid may be absorbed when the fetus becomes compressed upon itself and desiccated to form a fetus compressus. Occasionally the fetus

eventually becomes so dry and compressed that it resembles parchment
so called *fetus papyraceous*.

TYPES OF ABORTION

1) Spontaneous



Threatened, inevitable, complete, incomplete, and missed.

2) Induced

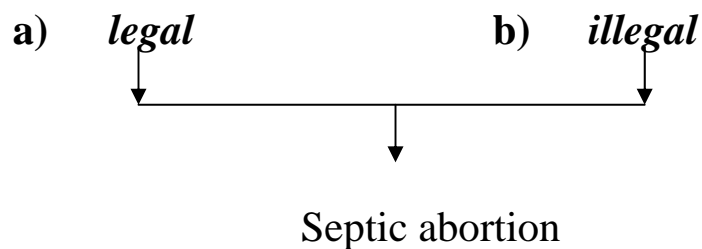


Fig :1 TYPES OF ABORTION

CATEGORIES OF ABORTION

1. Threatened abortion

It is a clinical entity where the process of abortion has started but has not progressed to a state from which recovery is impossible.

2. Inevitable abortion

It is a clinical type of abortion where the change has progressed to a state from where continuation of pregnancy is not possible. Inevitability of abortion is signaled by gross rupture of membranes in the presence of cervical dilatation.

3. Complete abortion

When the products of conception are expelled en masse, it is called complete abortion.

4. Incomplete abortion

When the entire products of conception are not expelled, instead a part of it is left inside the uterine cavity, it is called incomplete abortion.

5. Missed abortion

When the dead fetus had been retained inside the uterus for more than four weeks, it is called missed abortion.

6. Septic abortion

Any abortion associated with clinical evidence of infection of uterus and its contents is called septic abortion.

7. Habitual / recurrent abortion

It is defined as three or more consecutive spontaneous abortions.

DILATATION AND CURETTAGE

Dilatation and curettage (D&C) for women undergoing early pregnancy failure is one of the most common procedures in gynecology. Traditional management of early pregnancy loss involves D&C under general anesthesia, often as an inpatient. This practice is based on protocols established more than a century ago, and although medicine has advanced enormously, miscarriage management has not.

For instance, despite the relatively common usage of the curette, it is associated with higher rates of uterine perforation, increased blood loss, and more frequent blood transfusions⁵.

In our study D&C was done under paracervical block or intravenous anesthesia depending upon the pain perception. The age distribution taken for study is equal in both groups.

The average time taken was around 8 to 10 minutes in both groups. In our study the type of anesthesia, procedure, and patient morbidity was observed in both groups. All patients were followed up after 14 days with USG.

MANUAL VACUUM ASPIRATION

MVA offers a safe, effective, accessible and low-cost way to overcome barriers that hamper women's access to abortion services. MVA can be performed in typical clinical settings and as an outpatient procedure without the need for operating room facilities. MVA does not require electricity, and may be performed by such as midwives, nurse practitioners and physician assistants. Though D&C was once the standard of care it is still used in many centers. These qualities of MVA can help shift abortion services to community based health care settings, which not only decreases costs but also expands access to services. A World Health Organization Technical Working Group has listed vacuum aspiration as an essential element of care at the first-referral level (WHO, 1991).

Trained health care personnel around the world have used MVA technology to improve the quality of abortion care in diverse settings. MVA can also be used to perform menstrual regulation, treat incomplete abortions, perform endometrial biopsies and back-up failed abortions that were performed by either surgical or medical methods. This method has the capacity to dramatically expand women's access to abortion services. In remote areas, MVA may be the difference between safe and effective abortion services and no services at all. MVA can be extremely effective in improving the accessibility of high-quality abortion services at all levels of the health system. MVA plays a very important role in effective abortion care that is acceptable to women and responds to their needs—that is, care that can truly make a difference in improving women's health.

MVA SAFETY AND EFFICACY

MVA has been demonstrated to be effective and safe through clinical studies over the last 30 years for early elective abortion and management of early pregnancy loss. The World Health Organization (WHO) recommends MVA as a preferred method of uterine evacuation. When compared to sharp curettage (also known as dilation and curettage

or D&C), MVA is a safer, more readily accessible, and potentially less expensive way to offer high-quality services to women. The efficacy of MVA is comparable to D&C and is successful in approximately 99% of cases.

INDICATIONS FOR MVA USE

MVA also can be used for any indication that requires suction. Evacuation of the uterus, including

- ✓ Early miscarriage.
- ✓ MTP less than 12 weeks
- ✓ Back up for failed medical abortion⁶

Early miscarriage

MVA can be used successfully in early miscarriage with almost nil complications.

MTP less than 12 weeks

The efficacy of MVA in completion rates in most studies is almost 98% .Since women can make a decision about their pregnancy as early as three or four days after a missed period, we should provide safe

and effective options in early pregnancy which increases the opportunities for women to access desired care

Back up for Failed Medical Abortion

Aspiration is sometimes necessary for management of a continuing pregnancy despite the success rate of 95% in medical abortion using modern regimens of mifepristone and misoprostol. Thus MVA offers an alternative to D & C to manage this situation.

INVESTIGATIONS NEEDED IN CASE OF ABORTION

1. Blood Hemoglobin, Total count and Differential count.
2. Blood Grouping and Rh typing
3. Blood Sugar-fasting and Postprandial
4. VDRL, HIV, HBsAg
5. Urine –Routine and Microscopy.
6. Special investigation: USG

COMPONENTS OF MVA PROCEDURE

MVA Instruments⁶



- ❖ Aspirator
- ❖ lubricant
- ❖ Cannula (4–12 mm)
- ❖ Adaptor for cannula
- ❖ Speculam
- ❖ Tenaculum (sharp-toothed or atraumatic)
- ❖ Antiseptic solution, gauze, and small bowl.
- ❖ Dilators of various size.
- ❖ Local anesthesia for cervical block⁶

One part is a 50 cc syringe with a wide opening that creates a vacuum to pull the contents of the womb out⁸

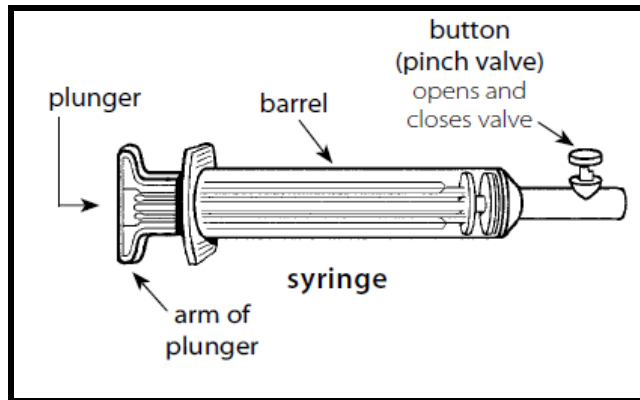


Fig 2: Parts of MVA

The other main part of the kit is a set of plastic tubes called cannulas. One end of the cannula will be attached to the syringe. The other end will be put inside the womb.

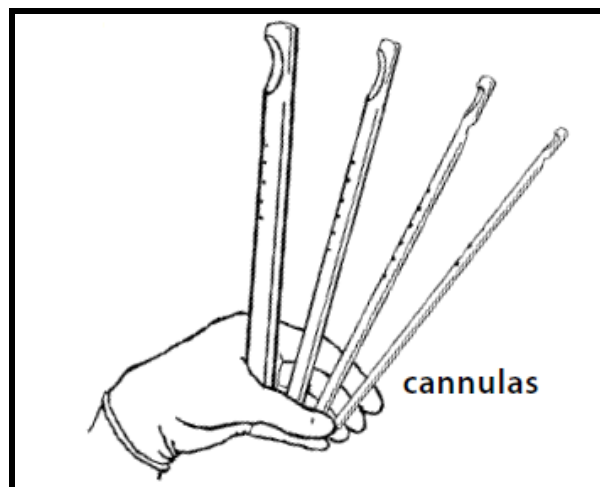


Fig 3: Different Sizes of MVA Cannula

Cannulas come in many different sizes (the size may be printed on it). The larger a woman's womb is, the larger a cannula you should use. This chart gives you an idea of which cannula might work best⁸

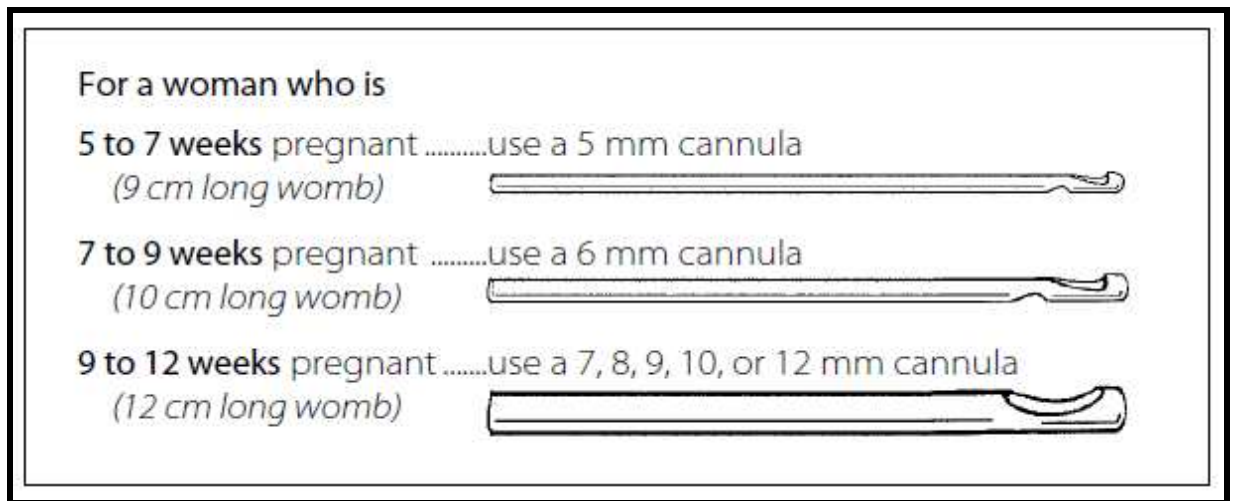


Fig 4: Measurements of Cannula

PAIN MANAGEMENT IN MVA

Surgical abortion in the first trimester are done under local anesthesia (para cervical block). Appropriate local anesthetic in the cervix can reduce pain associated with the procedure and also the inpatient admissions. Intravenous anesthesia proves patient satisfaction but does not significantly affect pain scoring².

MVA allows a lower level of pain control medication than sharp curettage. Cervical block which has been proven to be very safe for use in abortion procedures can be effectively used in conjunction with analgesics for pain control during MVA. Cervical block reduces

recovery time and requires fewer expenses for personnel, infrastructure and equipment.

In contrast, the D&C procedure is typically performed with general anesthetic or heavy sedation which is expensive and also general anesthesia is associated with an increased complications from blood loss, cervical injury, uterine perforation and subsequent abdominal hemorrhage. Heavy anesthesia also places a strain on the health care system, as it requires more complicated facilities and equipment. In many countries, reliance upon general anesthesia limits the settings in which surgical abortions can be performed.

The patient's reduced perception of pain with MVA is particularly notable in comparison with the D&C procedure. Reducing pain also lessens the patient's anxiety and fear, thereby improving her overall satisfaction with the procedure. By allowing pain to be effectively managed with cervical block, analgesics and verbal support, MVA lowers costs, improves safety, enhances patient satisfaction and expands service availability. In our study pain is scored using visual analogue scale (fig 5).

Edelman (Edelman 2001) found that both, pain and duration of operation may be less with more experienced operators. D&C continues to be used in many countries. The statistically significant reduction operating time with vacuum aspiration (1.8minutes) compared to D&C may be of importance for women undergoing the operation under local anaesthesia.

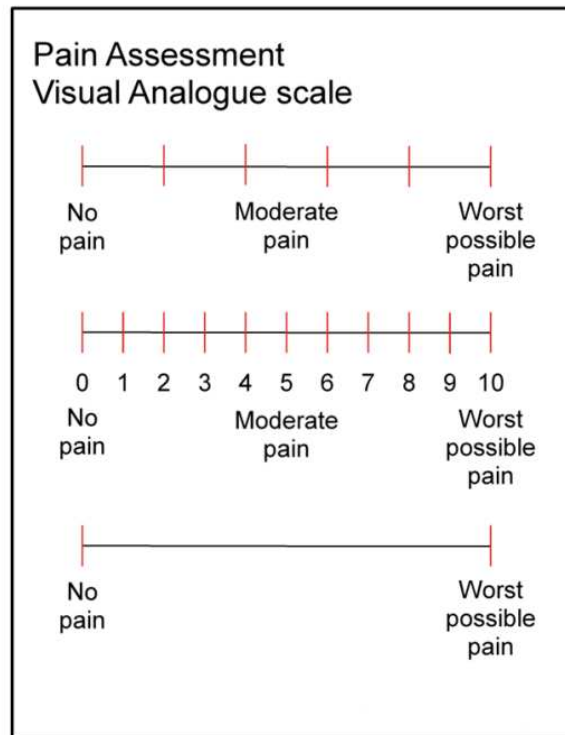
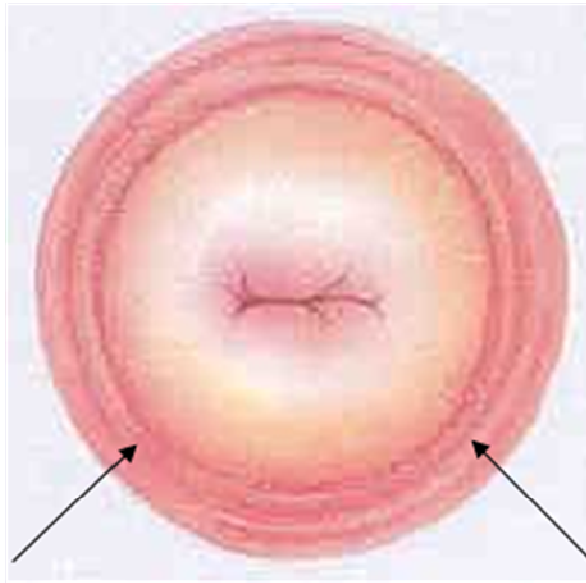


Fig 5: Visual Analogue Scale



Cervical Block Given at 3 & 9' clock position

DILATATION OF THE CERVIX

Dilatation of cervix is done according to the gestational age. Excessive dilatation of the cervix can cause cervical or uterine injury which is not required in MVA compared to D&C⁶.

OPERTATIVE STEPS

1. Injection local anesthesia was injected in the cervix⁷
2. Vacuum was created in 60 ml double valve MVA syringe.
 - Close the valve by pushing the button inward and forward.
The button will make a “click” sound and will stay stuck in place until you open it again⁸

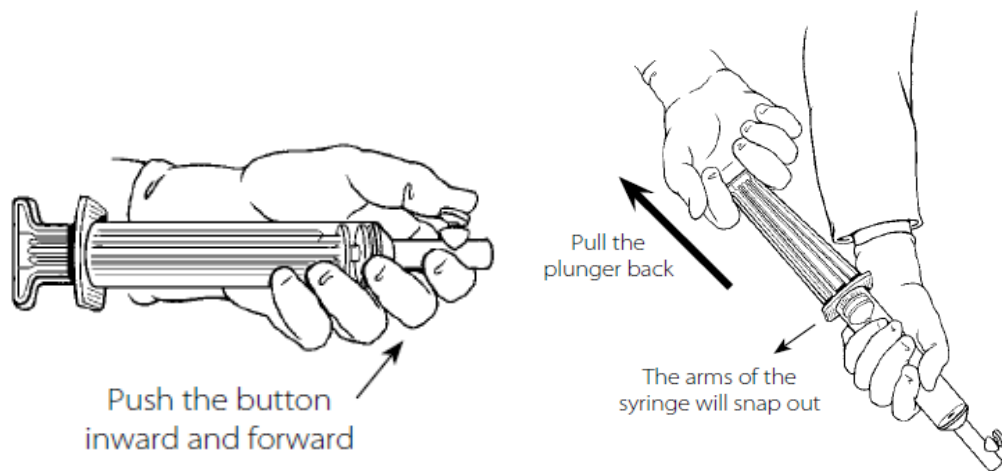


Fig 6: Doing the MVA

- Hold the barrel of the syringe with one hand and pull the plunger back with the other hand, until the arms of the plunger snap outward at the end of the syringe barrel. Check the arms of the plunger. They should both be out as far as they can go. With the arms snapped in this position, you should not be able to push the plunger back into the barrel⁸

1. The uterus was re-evaluated by bimanual examination.
2. Cervix is cleansed by antiseptic lotion and paracervical block/IV anesthesia is given.
3. The size of the cannula is selected (varying from 4mm – 12mm) to snugly fit in the cervical canal.

4. Using no touch technique the cannula is inserted through the cervix towards the fundus.
5. The syringe is attached to the canula and the pinch valves released allowing the vacuum to get transferred to the uterine cavity.
6. Contents of the uterus were evacuated by using rotatory or back and forth movements of the cannula.
7. Appearance of foam or bubbles, absence of more products getting aspirated, a gritty sensation as the cannula passes over the uterine walls, and a feel of the uterus contracting around the cannula were considered as signs of completeness of the procedure.
8. Inspection of chorionic villi is done after evacuation. The average time taken for the procedure was 8 minutes with a maximum of 10 minutes. All Patients were discharged after 2 days after advising an oral antibiotic and an analgesic. All of them were given family planning advice and follow up scan was done after 14 days.

CONTRAINDICATIONS AND CAUTION IN USE OF MVA

There are no contraindications for MVA when used for MTP up to 12 weeks of gestation. When MTP is done using MVA between 8 -12 weeks, it may require emptying of syringe barrel 2 or more times to complete the procedure. .Alternatively, multiple syringes may be used in succession ⁶.

MVA should not be used for endometrial biopsy in the case of suspected pregnancy and should be used with caution in women who have:

- Anomalies of uterus.
- Blood dyscrasias.
- Acute pelvic infection.
- Extreme anxiety.
- Life-threatening medical conditions must be addressed and managed before uterine aspiration, regardless of the vacuum source.⁶

POSSIBLE MVA COMPLICATIONS

MVA used for MTP is associated with an overall complication rate of about 2%, the majority of which required re aspiration and perforation. The most important part in MTP procedure is diagnosing complication.⁶

- ***Incomplete evacuation*** By examining the products of conception the completeness of procedure can be confirmed. Incomplete evacuation can be treated by repeating the uterine aspiration.⁶
- ***Uterine perforation*** This type of complication can be avoided by careful assessment of gestational age and position of cervix. Uterine perforation is most commonly seen in D&C.
- ***Cervical laceration***
- ***Pelvic infection***
- ***Hemorrhage*** excessive bleeding is rare but can occur following MVA.
- ***Hematometra*** This condition can be treated by re-aspirating the uterus, although dilatation alone is often sufficient⁶
- ***Vagal reaction*** This usually occurs near or after completion of the procedure. Women usually feel giddiness or nausea. Stop the procedure until the reaction has ceased. Then made to lie either

flat or in reverse Trendelenburg with her feet raised above the level of her heart. Once the reaction has subsided, continue the procedure.⁶

CONTROLLING INFECTION

Using of a no-touch technique and antibiotics can help to avoid infection.

POST PROCEDURE PATIENT MONITORING

After the procedure the patient was monitored for vitals, urine output, sign of excessive bleeding and abdominal pain. USG was done immediately and after 2 days to look for retained products and if any then repeat procedure was done.⁶

TISSUE EXAMINATION

The products of conception(POC) is examined to confirm the completeness of procedure. For very early gestations, POC are less likely to be disrupted during the aspiration when using MVA as compared to D&C. Lack of complete POC identification may indicate an ongoing or ectopic pregnancy⁶.

MANUAL VACCUUM ASPIRATION:

SERVICE DELIVERY

Doctors appreciate the simplicity, portability and cost-effectiveness of MVA. Any doctors who engages in gynecological services is probably well equipped to provide MVA. The instruments do not require electricity, and providers at various levels of the health care system can safely perform MVA.

MVA is easy to use in a variety of settings, including first-referral level sites, primary care facilities, medical offices and clinics. Its simplicity helps move abortion services out of hospital and operating room settings where D&C is typically performed.

MVA also allows doctors to offer women safe and effective abortions in a private office or when the operating theater is booked, reducing delays and decreasing the number of staff required for the procedure.

The burden on health care systems is reduced when a doctors is able to perform an abortion at the time the woman presents at the facility, rather than waiting for physicians and operating rooms to become available as in case of D&C. MVA makes safe abortions

possible in low-resource or remote areas, particularly where other methods are not feasible.

EQUIPMENT AND PERSONNEL COSTS

MVA is a relatively inexpensive service to provide. Reusing the MVA aspirator after disinfection or sterilization helps reduce costs. Even when limited to single-use additional savings are realized when abortion services are moved out of the operating theater or emergency room, reducing expenditures for anesthesia, hospital infrastructure, sterile supplies and patient recovery care.

Because of MVA's effectiveness, many patients do not require a follow-up visit and many women, particularly those in rural areas, do not find it feasible to return for a second visit. Some clinics, however, require or encourage patients to return for a follow-up exam to confirm that there are no complications and that the procedure was successful.

CONTRACEPTIVE COUNSELLING

Contraceptive counseling is another essential component of patient-centered abortion care. A woman seeking an abortion does so because she does not want to be pregnant at that time; she may want to avoid childbearing for the immediate future, if not longer. Pregnancy can occur almost immediately after abortion. The abortion procedure therefore offers a convenient opportunity for women to receive contraceptive information and services. The brief recovery period after MVA/D&C is an apt time to discuss contraception with patients.

Contraceptive counseling and care can be integrated into abortion services regardless of whether the procedure is performed in a doctor's office, hospital setting, and clinic or community health center. What matters most is that the patient leaves with information and methods she can use to prevent further unwanted pregnancies.

3. REVIEW OF LITERATURE

K. Mahomed J. Healy S. Tandon

A prospective longitudinal study was carried out in two Harare Hospitals to determine whether Manual Vacuum Aspiration (MVA) was as safe and as effective as sharp curettage for treatment of incomplete abortion. Based on procedure-related complications at the time of treatment, MVA was found to be as safe as sharp curettage in treating incomplete abortion ≤ 12 weeks gestation. MVA was more effective than sharp curettage in achieving complete uterine evacuation (0% incomplete evacuation vs. 0.7%, $P < 0.05$)⁹. Our study also proves the same.

Am J Obstet Gynecol 2000 : 183 : S76-S83

“Surgical abortion by vacuum aspiration is one of the most commonly reported surgical procedures in the United States”. Manual vacuum aspiration with a handheld syringe safely accomplishes early abortion in a variety of settings, from elective abortion in the office or clinic setting to emergency care of a patient with an incomplete abortion².

According to the study by P.D. Blumenthal R.E. Remsburg

Traditionally, management of incomplete abortion involves use of D&C or suction curettage in the operating room. Such management is costly and time- consuming. In order to potentially save time and money, they studied the use of Manual Vacuum Aspiration Curettage (MVAC) for the management of this procedure. The results were compared.

MVA procedures resulted in significant savings in terms of both waiting times and costs. Waiting time was reduced by 52% and procedure time was reduced from a mean of 33 min to 19 min ($P < 0.01$). Total hospital costs were reduced by 41% ($P < 0.01$). So they concluded that the use of manual vacuum aspiration curettage in the management of incomplete abortion can reduce hospital costs and save time for both patients and clinicians. In our study there is no significant difference in time taken by both procedures.

An article by k.Rogo reviews the technologies used to diagnose pregnancy and manage abortion in developing countries. The author discusses methods of diagnosing pregnancy including physical examination, laboratory and home testing, and ultrasound as methods for performing safe abortions. Due to manual vacuum aspiration (MVA) advances, vacuum aspiration has become safer and more

feasible in low-resource settings. The author stresses the importance of post-abortion care and post-abortion contraception and, in the conclusion, identifies six areas in which technology can reduce abortion-related morbidity and mortality: pregnancy prevention, early diagnosis of pregnancy, accurate assessment of gestation, standardization and supply of MVA technology, and simple and affordable regimens for medical abortion.

The study conducted by Greenslade et al., 1993b; Freedman et al., 1986; Cates and Grimes, 1981 says the complication rates for abortions conducted by paramedics appear to be lower than those reported in studies in which physicians performed the abortion¹⁹

Focus Group, 1998 says Midwives and other medical staff are now trained to perform MVA, making services more widely available and lessening the burden on physicians and hospitals.

Verkuyl 1993 reviews data from two studies (involving 550 women) where vacuum aspiration was compared to sharp metal curettage. Uterine perforation and need for re-evacuation were evaluated by both trials. The remaining outcomes (sepsis, pain, blood loss, post operative hemoglobin levels, duration of procedure and duration of bleeding) were evaluated by only one trial. Vacuum aspiration was

associated with decreased blood loss and fewer women with blood loss greater than or equal to 100 ml, risk ratio (RR) 0.28, 95%CI 0.10 to 0.73; and fewer women with a post-operative hemoglobin level less than 10 g/dl (RR 0.55). Fewer women undergoing vacuum aspiration reported moderate to severe pain during the procedure (RR 0.74), and the duration of the procedure was shorter for vacuum aspiration than for sharp metal curettage. The remaining findings were not statistically significant. For vacuum aspiration versus sharp curettage respectively, the results were as follows: uterine perforation 0/227 versus 1/221 (RR 0.32) need for re-evacuation 3/227 versus 2/236 (RR 1.50), incidence of sepsis 2/138 versus 7/132 (RR 0.27).

The results indicate that vacuum aspiration is safe, quicker to perform, and less painful than sharp curettage, as evidenced by statistically significant findings of decreased blood loss, decreased perception of pain, and a shorter duration of the vacuum aspiration procedure. Uterine perforation is a serious complication of surgical evacuation procedures which is relatively rare with either of the approaches. Of more than 200 patients included in each arm, perforation occurred in one case in the sharp curettage group, and none in the vacuum aspiration group. There were few cases that required re-

evacuation in either group of both trials. Given the rare occurrence of perforation and need for re-evacuation with either approach, very large trials would be needed to evaluate any significant differences between vacuum aspiration and sharp curettage⁴⁴. In our study blood loss was comparatively less in patients who underwent MVA, also the Pain score was also less in MVA group.

Milingos 2009 says” *Vacuum aspiration can be performed without the need for a fully equipped and staffed operating theatre as it can be done with or without electricity, under local anesthesia or sedation*³².”

A recent observational study has also concluded that manual vacuum aspiration could be routinely considered to treat incomplete miscarriage, thus avoiding the need for general anesthesia and access to operating theater. It can therefore be performed in settings with limited resources, saving time and money, and possibly minimizing complications. Eliminating the need for transport to a better equipped facility might decrease the severity of an infection, or decrease blood loss and the subsequent need for transfusions.

In conclusion, the results of this review suggest that vacuum aspiration is at least as effective as sharp curettage, if not more effective

in the management of incomplete miscarriage. However, sharp curettage continues to be used widely in many parts of the world. Some clinicians argue that in experienced hands it is safe and effective and are therefore reluctant to change to suction curettage.

Surgical procedures for evacuating incomplete miscarriage (Review) 6 Says Manual vacuum aspiration is also well accepted for surgical uterine evacuation in low-income settings, as illustrated in a review of 10 major post abortion care projects conducted in Latin America in the period 1991–2002.

GreenSlade 1993 conducted a study in Ghana in 2007 revealed that despite consensus about the serious need for the merit the change to this technology as been suggested that vacuum aspiration is more cost effective than sharp curettage.

To address the harmful health consequences of unsafe abortion, a post abortion care model was developed in 1994. The model lists three essential elements:

1. Emergency treatment for complications of spontaneous or induced abortion;
2. Post abortion family planning counselling and services;

3. Linkage between emergency care and other reproductive health services, such as management of sexually transmitted diseases.

The post abortion care model has been implemented in many countries with restrictive abortion laws as a means to address the complications associated with unsafe abortion. When focusing on emergency treatment for abortion complications, manual vacuum aspiration (MVA) is considered a cost-effective alternative to standard surgical curettage, which is often used for emergency care in low-income settings.

The efficacy of MVA has been assessed in a retrospective Scottish study, which reported the efficacy of the procedure to be 94.7% among 245 patients undergoing MVA for incomplete abortion.

A meta-analysis has also measured the safety, efficacy and acceptability of MVA in comparison with electric vacuum aspiration. There was no significant difference in complete abortion rate and participants' satisfaction, whereas the operation time was shorter for vacuum aspiration.

The need for re-evacuation was slightly lower in the vacuum aspiration group by *Tan 1969*.

In a large multicentre cohort study, data from over 4400 women undergoing first trimester vacuum aspiration or D&C were analysed. The total complication rate varied with the gestational age and the method used. Vacuum aspiration was associated with lower rates of complications at 9 to 12 weeks when compared to D&C. Major complication rates such as excessive blood loss, uterine injury, prolonged bleeding and repeat curettage and pelvic infection were higher in both groups with increased gestational age.

Edelman (Edelman 2001)

“Found that both, pain and duration of operation may be less with more experienced operators. D&C continues to be used in many countries. The statistically significant reduction in operating time with vacuum aspiration (1.8minutes) compared to D&C may be of importance for women undergoing the operation under local anaesthesia. Hand-held syringes for MVA are inexpensive, require little maintenance and can be the method of choice for early surgical abortion in resources trained settings”. Bird 2003. The Cochrane Collaboration. Published by JohnWiley & Sons, Ltd.

SAFETY AND EFFICACY OF MVA⁵

STUDY	DESIGN	DIAGNOSIS	TREATMENT	CONTROL	CONCLUSIONS
Mahomed et al. (1994)	Cohort	Incomplete abortions	MVA under local (n=589)	Sharp curettage with general anesthesia (n=589)	Equal safety and effectiveness of MVA.
Lukeman and Pogharian (1996)	Case-control	Incomplete abortions	MVA (n=432)	Sharp Curettage (n=869)	Equal safety and effectiveness of MVA.
Verkuyt and Crowther (1993)	Randomized controlled trial	Incomplete abortions	MVA (n=179)	Sharp Curettage (n=178)	MVA had lower rate of excessive bleeding MVA was shorter procedure
De Jonge et al. (1994)	Randomized controlled	Incomplete abortions	MVA (n=73)	Sharp Curettage (n=68)	MVA group had fewer transfusions than the sharp curettage group (17% vs 35%)
Kizza and Rogo (1990)	Cohort	Incomplete abortions	MVA (n=300)	Sharp Curettage (n=285)	Equal safety and effectiveness of MVA (incomplete evacuation)
Hemlin and Moller (2001)	Randomized	Induced abortion	MVA (n=99)	Electric Vacuum (n=98)	MVA and EVA had equivalent efficacy and safety
Westfall et al. (1998)	Retrospective	Induced abortion	MVA (n=1677)	None	MVA was 99.5% effective. Postoperative infections infrequent (0.5%) and rare uterine perforations (0.05%)

4. AIM OF STUDY

To compare the efficacy of manual vacuum aspiration against curettage in first trimester incomplete abortion in terms of type of anesthesia, procedure, and patient morbidity pattern.

ANESTHESIA: The type of anesthesia used is either cervical block or intravenous anesthesia depending upon pain perception by the patient.

PROCEDURE: The procedure done for induced abortion is either manual vacuum aspiration or curettage. The efficacy of these two procedures is compared in terms of blood loss, blood transfusion, retained products, repeat procedure.

PATIENT MORBIDITY: Patient's morbidity is compared in terms of, complications like cervical laceration, uterine perforation, stay in hospital for more than two days.

STUDY DESIGN

Our study is a case control study conducted at Institute of Social Obstetrics, Govt. Kasturba Gandhi Hospital, Chennai between the period September 2010 –and September 2011.

5. MATERIALS AND METHODS

All women seeking MTP for incomplete abortion in our hospital between September 2010 - September 2011 were admitted.

In these women who belonged to first trimester was taken for our study. Our sample size (CASES) was 100, who underwent manual vacuum aspiration was compared with 100 CONTROLS who were offered curettage .

INCLUSION CRITERIA

- All pregnant women seeking MTP for incomplete abortion whose age was < 35 yrs.
- Women who stayed near by the hospital for easy access
- Who can come for follow up.

EXCLUSION CRITERIA

1. Patients with medical complications like uncontrolled hypertension, diabetes.
2. Blood dyscrasias, heart disease.
3. All MTPs attempted outside our institution.
4. Patients with evidence of sepsis.

6. ANALYSIS OF RESULT

TYPE OF ANAESTHESIA USED

TABLE 1

			MVA/CURETTAGE		
			1	2	Total
Anaesthesia	cervical block	Count	89	66	155
		% within MVA/CURETTAGE	89.0%	66.0%	77.5%
		% of Total	44.5%	33.0%	77.5%
	IV	Count	11	34	45
		% within MVA/CURETTAGE	11.0%	34.0%	22.5%
		% of Total	5.5%	17.0%	22.5%
	Total	Count	100	100	200
		% within MVA/CURETTAGE	100.0%	100.0%	100.0%
		% of Total	50.0%	50.0%	100.0%

This table indicates the type of anesthesia used for both cases and controls.

CHI-SQUARE TESTS

	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	15.168 ^a	1	.000		
Continuity Correction ^b	13.878	1	.000		
Likelihood Ratio	15.755	1	.000		
Fisher's Exact Test				.000	.000
N of Valid Cases	200				

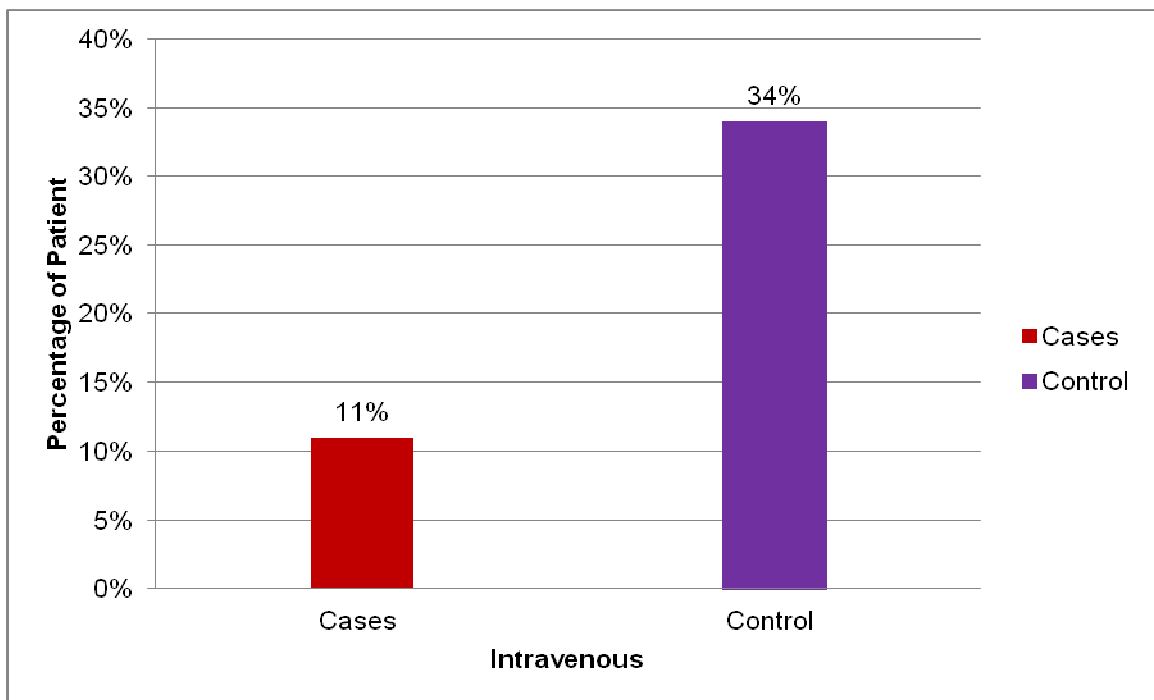
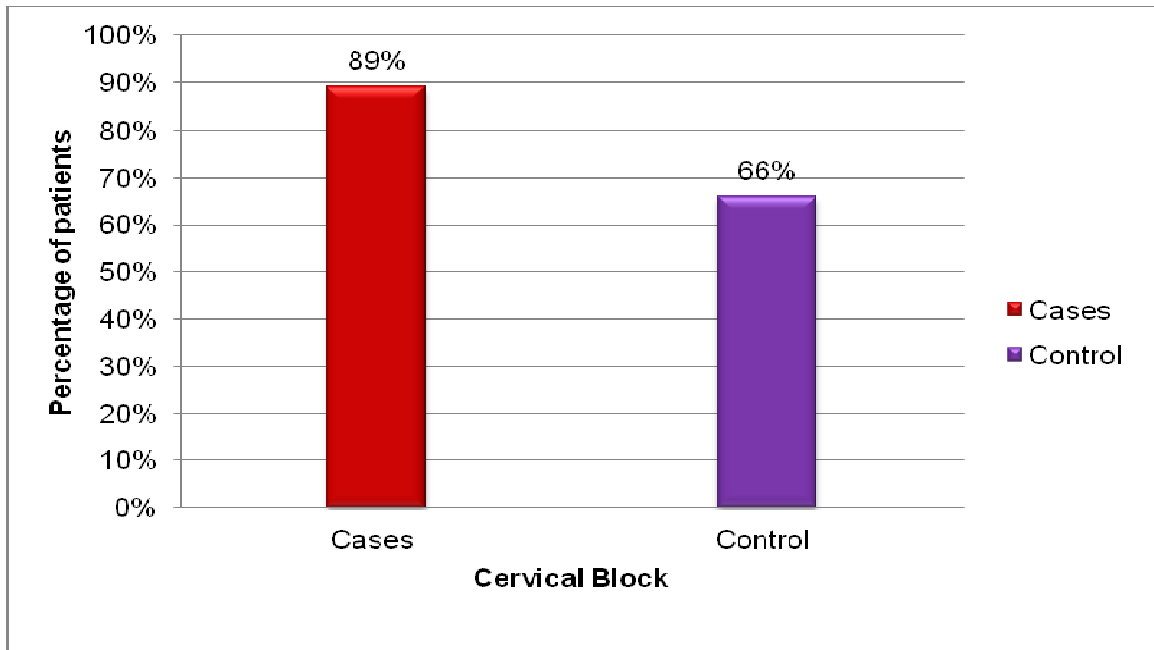
Chi square -15.168, and $p < .000$ which is significant

TABLE 1

This table indicates the type of anesthesia used for both cases and controls.

Out of the 100 patients in cases 89% was given cervical block compared to control group which is 66%. In control out of 100 patients 34% of patients needed intra venous anesthesia. The p value is < 0.000 which is significant and chi square is 15.168.

CHART : 1



This bar diagram represent the percentage of cervical block and intravenous anesthesia used in cases and controls.

Blood LOSS - PADS USED /DAY

TABLE 2

	MVA/CURETTA GE	N	Mean	Std. Deviation	Std. Error Mean
Blood Loss PAD/DAY	1	100	3.32	1.348	.135
	2	100	3.95	1.274	.127

TABLE 2

This table shows the average no of pads used by both cases and controls. The no of pads used per day was more in controls (3.95) than the cases (3.32) .

INDEPENDENT SAMPLES TEST

		Levene's Test for Equality of Variances		t-test for Equality of Means	
		F	Sig.	t	df
Blood Loss PAD/DAY	Equal variances assumed	1.279	.260	-3.397	198
	Equal variances not assumed			-3.397	197.385

INDEPENDENT SAMPLES TEST

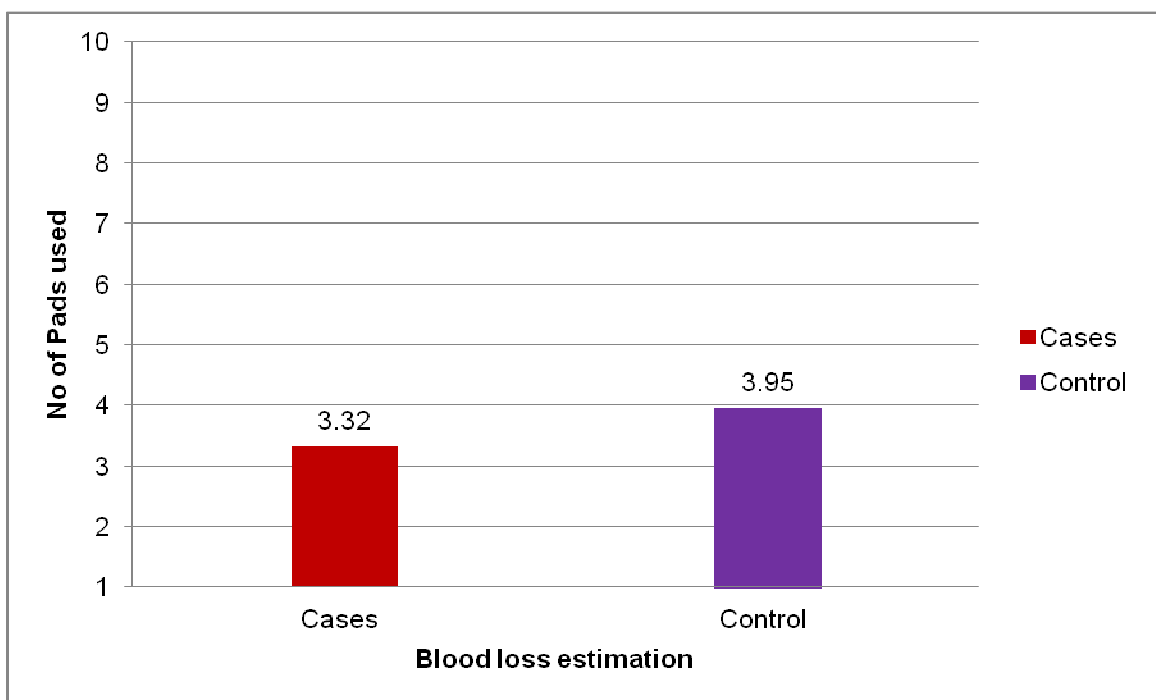
		t-test for Equality of Means		
		Sig. (2-tailed)	Mean Difference	Std. Error Difference
Blood Loss PAD/DAY	Equal variances assumed	.001	-.630	.185
	Equal variances not assumed	.001	-.630	.185

The p value is .001 which is significant.

INDEPENDENT SAMPLES TEST

		t-test for Equality of Means	
		95% Confidence Interval of the Difference	
		Lower	Upper
Blood Loss PAD/DAY	Equal variances assumed	-.996	-.264
	Equal variances not assumed	-.996	-.264

CHART: 2



This bar diagram represents the average no of pads used by cases and controls.

BLOOD TRANSFUSION

TABLE 3

			MVA/CURETTAGE		
			1	2	Total
Blood Transfusion	no	Count	96	88	184
		% within MVA/CURETTAGE	96.0%	88.0%	92.0%
		% of Total	48.0%	44.0%	92.0%
	yes	Count	4	12	16
		% within MVA/CURETTAGE	4.0%	12.0%	8.0%
		% of Total	2.0%	6.0%	8.0%
Total	Count		100	100	200
	% within MVA/CURETTAGE		100.0%	100.0%	100.0%
	% of Total		50.0%	50.0%	100.0%

This table compares the amount of blood transfused in both cases and controls.

CHI-SQUARE TESTS

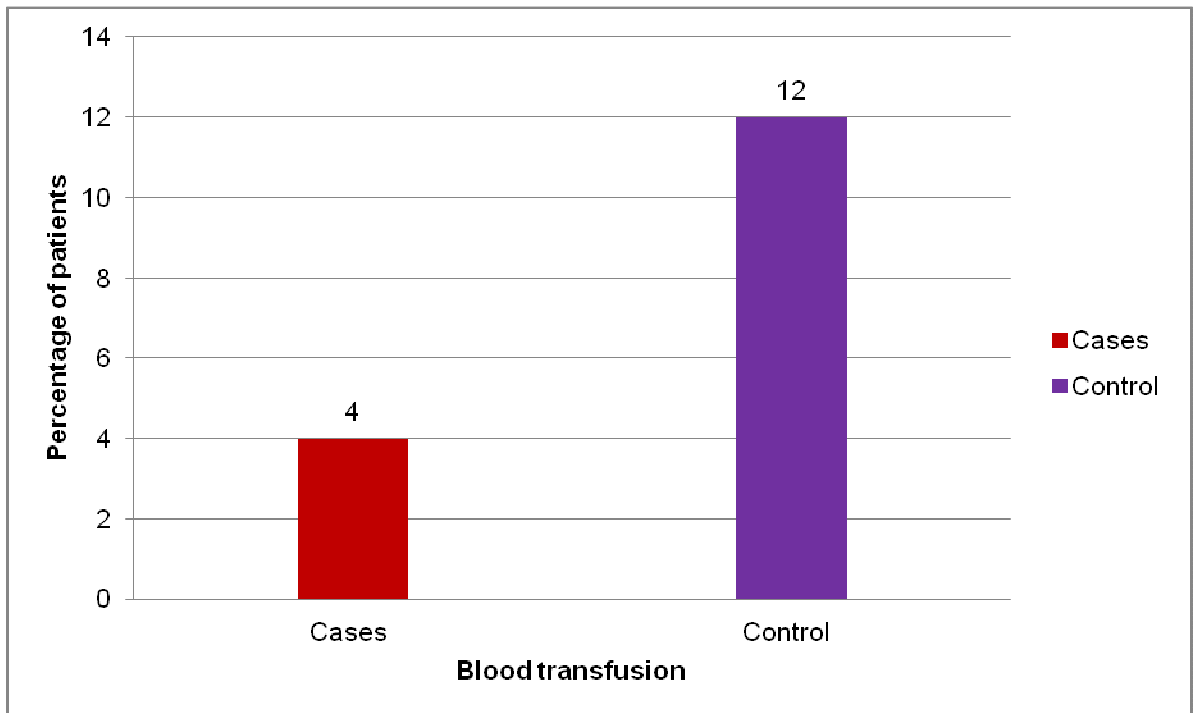
	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	4.348 ^a	1	.037		
Continuity Correction ^b	3.329	1	.068		
Likelihood Ratio	4.534	1	.033		
Fisher's Exact Test				.065	.033
N of Valid Cases	200				

The chi square is 4.348, and p value is < .037 which is significant.

TABLE 3

It indicates that the no of blood transfusion is more in controls (12%) compared to cases. (4%).The p value is <0.037 which is significant.

CHART : 3



**This bar diagram represents the number of blood transfusion given
in cases and control group.**

PERCENTAGE OF RETAINED PRODUCTS

TABLE 4

			MVA/CURETTAGE		
			1	2	Total
Retained Products	No	Count	82	58	140
		% within MVA/CURETTAGE	82.0%	58.0%	70.0%
		% of Total	41.0%	29.0%	70.0%
	Yes	Count	18	42	60
		% within MVA/CURETTAGE	18.0%	42.0%	30.0%
		% of Total	9.0%	21.0%	30.0%
Total		Count	100	100	200
		% within MVA/CURETTAGE	100.0%	100.0%	100.0%
		% of Total	50.0%	50.0%	100.0%

This table shows the percentage of patients who had retained products in cases and controls.

CHI-SQUARE TESTS

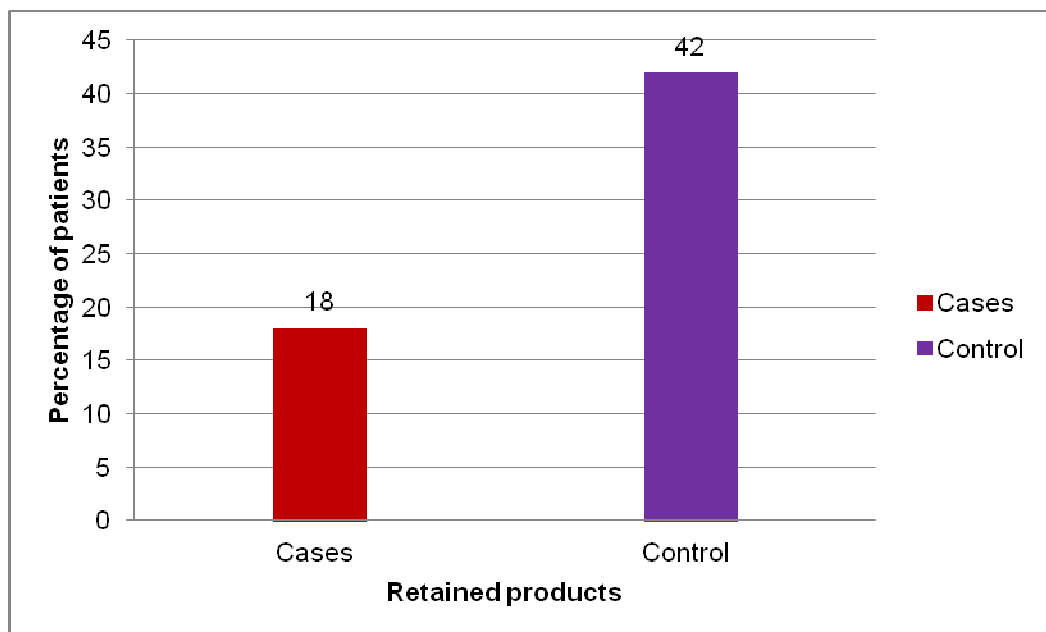
	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	13.714 ^a	1	.000		
Continuity Correction ^b	12.595	1	.000		
Likelihood Ratio	14.009	1	.000		
Fisher's Exact Test				.000	.000
N of Valid Cases	200				

chi square is 13.714,p value is .000 which is significant

TABLE 4

The % of retained products is more in controls (42%) than in cases (12%). The p value is<0.000 which is significant.

CHART : 4



This bar diagram represents the number of patients who had retained products in cases and control group.

REPEAT PROCEDURE

TABLE 5

			MVA/CURETTAGE		
			1	2	Total
Repeat Procedure	no	Count	92	79	171
		% within MVA/CURETTAGE	92.0%	79.0%	85.5%
		% of Total	46.0%	39.5%	85.5%
	yes	Count	8	21	29
		% within MVA/CURETTAGE	8.0%	21.0%	14.5%
		% of Total	4.0%	10.5%	14.5%
Total		Count	100	100	200
		% within MVA/CURETTAGE	100.0%	100.0%	100.0%
		% of Total	50.0%	50.0%	100.0%

This table shows the percentage of patients who needed repeat procedure.

CHI-SQUARE TESTS

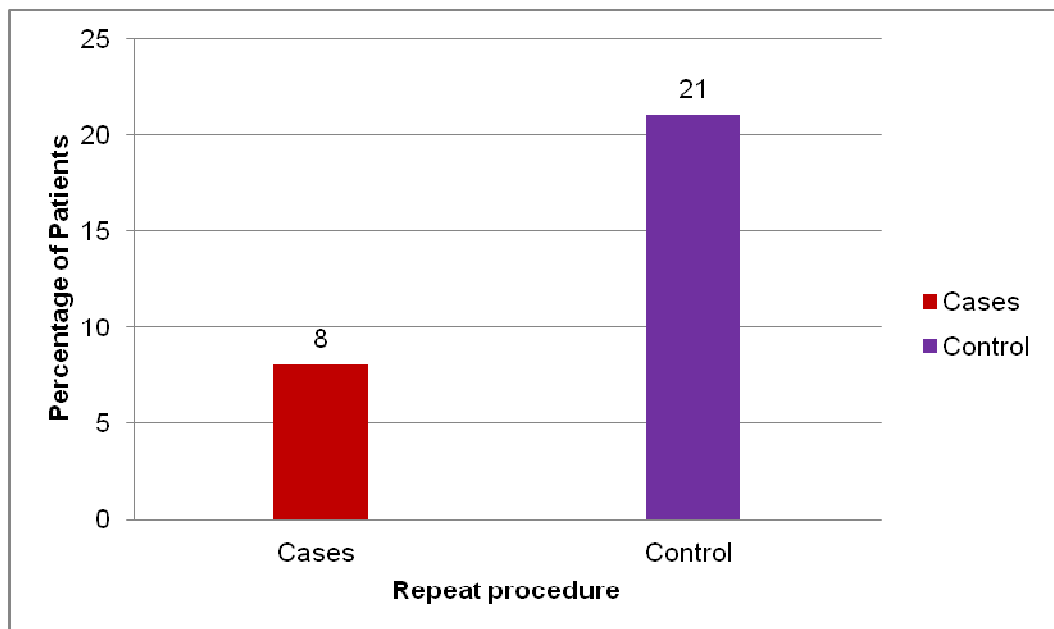
	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	6.816 ^a	1	.009		
Continuity Correction ^b	5.808	1	.016		
Likelihood Ratio	7.030	1	.008		
Fisher's Exact Test				.015	.007
N of Valid Cases	200				

Chi square is 6.816 and p is < 0.009 which is significant.

TABLE 5

The repeat procedure was more in controls (21%) than in cases is 8%.

CHART :5



This bar diagram represents the number of patients who needed repeat procedure in both cases and control group.

STAY IN HOSPITAL

TABLE 6

			MVA/CURETTAGE		
			1	2	Total
Stay in Hospital	1	Count	91	76	167
		% within MVA/CURETTAGE	91.0%	76.0%	83.5%
		% of Total	45.5%	38.0%	83.5%
	2	Count	9	24	33
		% within MVA/CURETTAGE	9.0%	24.0%	16.5%
		% of Total	4.5%	12.0%	16.5%
Total		Count	100	100	200
		% within MVA/CURETTAGE	100.0%	100.0%	100.0%
		% of Total	50.0%	50.0%	100.0%

This table shows the percentage of people who stayed more than 2 days in the hospital.

CHI-SQUARE TESTS

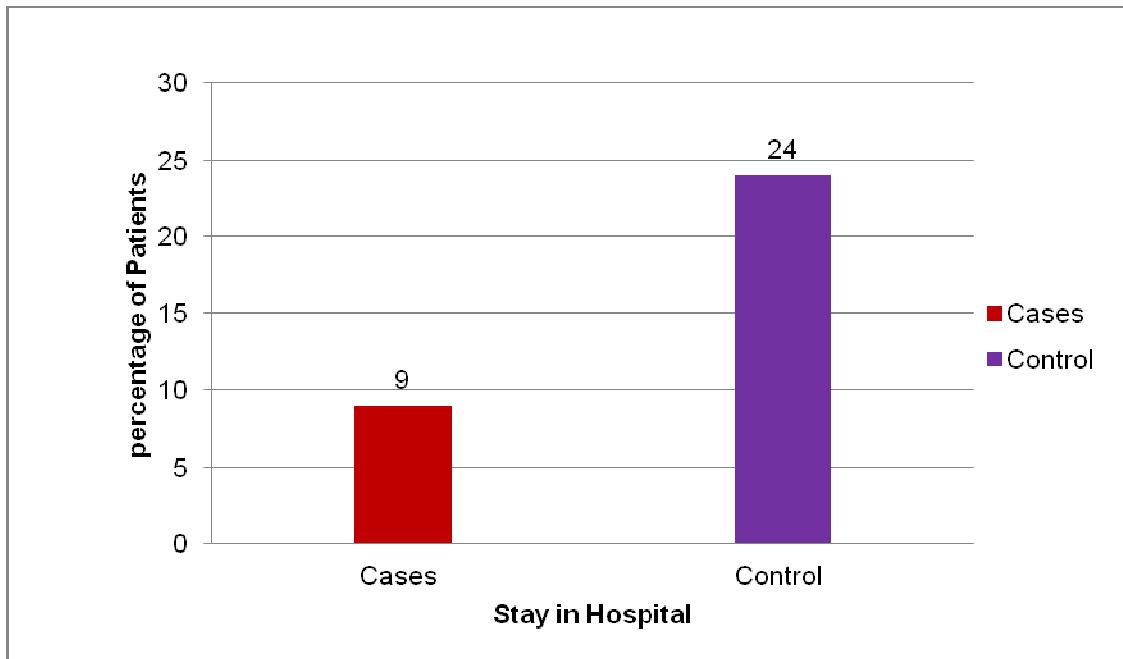
	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	8.165 ^a	1	.004		
Continuity Correction	7.113	1	.008		
Likelihood Ratio	8.424	1	.004		
Fisher's Exact Test				.007	.003
Linear-by-Linear Association	8.125	1	.004		
N of Valid Cases	200				

chi square is 8.165,p is .004 which is significant

TABLE 6

The stay in hospital for >than 2 days is more in controls is (24%) than in cases (9%). The p value is 0.004 which is significant

CHART:6



This bar diagram represent the percentage of patients who stayed more than 2 days in cases and control group.

CERVICAL LACERATION

TABLE 7

			MVA/CURETTAGE		
			1	2	Total
cervical laceration	No	Count	100	88	188
		% within MVA/CURETTAGE	100.0%	88.0%	94.0%
	Yes	Count	0	12	12
		% within MVA/CURETTAGE	.0%	12.0%	6.0%
Total		Count	100	100	200
		% within MVA/CURETTAGE	100.0%	100.0%	100.0%

This table compares the percentage of patients who had cervical laceration in both cases and controls.

CHI-SQUARE TESTS

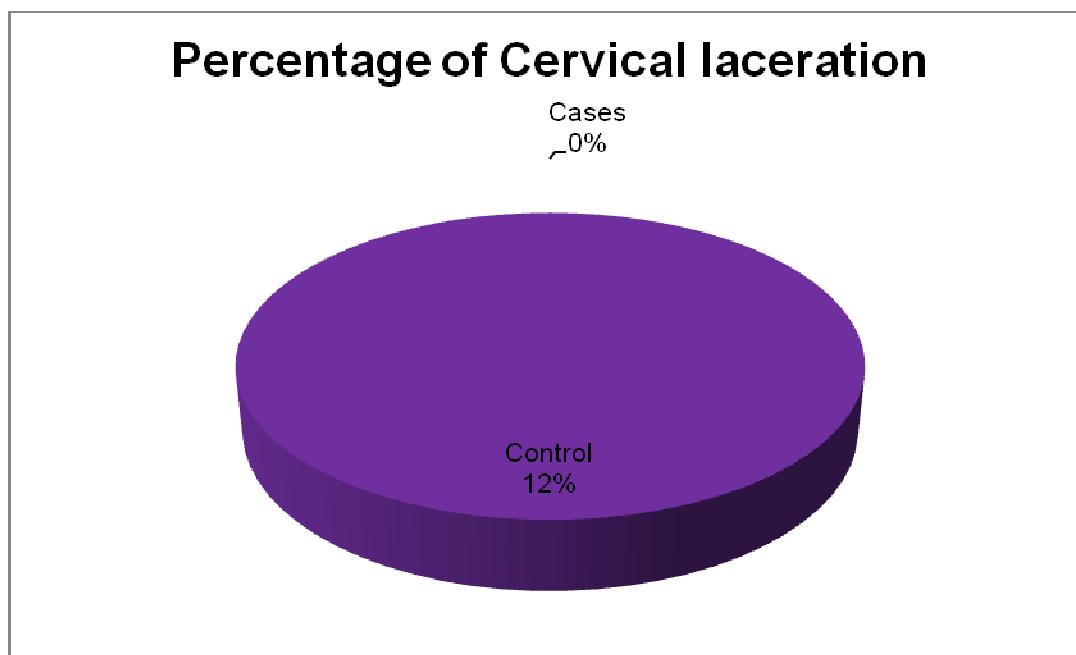
	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	12.766 ^a	1	.000		
Continuity Correction	10.727	1	.001		
Likelihood Ratio	17.402	1	.000		
Fisher's Exact Test				.000	.000
N of Valid Cases	200				

chi square is 12.766, p is .000 which is significant

TABLE 7

The cervical laceration is 12% in controls compared to cases which is 0%. The p value is <0.000 which is significant.

CHART : 7



This pie chart shows the percentage of cervical laceration in cases (0%) and controls (12%).

HEMOGLOBIN PRE AND POST PROCEDURE

TABLE 8

	Mean	N	Std. Deviation	Std. Error Mean
Pair 1 HEMOGLOBINPRE	8.7440	200	.32324	.02286
HEMOGLOBINPOST	8.6610	200	.34244	.02421

This table indicates the mean hemoglobin in both cases and controls

Paired Samples Correlations

	N	Correlation	Sig.
Pair 1 HEMOGLOBINPRE & HEMOGLOBINPOST	200	.928	.000

PAIRED SAMPLES TEST

	Paired Differences				
				95% Confidence Interval of the Difference	
	Mean	Std. Deviation	Std. Error Mean	Lower	Upper
Pair 1 HEMOGLOBINPRE – HEMOGLOBINPOST	.08300	.12804	.00905	.06515	.10085

PAIRED SAMPLES TEST

		t	df	Sig. (2-tailed)
Pair 1	HEMOGLOBINPRE – HEMOGLOBINPOST	9.168	199	.000

MVA DATA

PAIRED SAMPLES STATISTICS

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	HEMOGLOBIN PRE	8.6830	100	.27526	.02753
	HEMOGLOBIN POST	8.6410	100	.29305	.02930

This table indicates the mean hemoglobin pre procedure and post procedure in cases.

PAIRED SAMPLES CORRELATIONS

		N	Correlation	Sig.
Pair 1	HEMOGLOBINPRE & HEMOGLOBINPOST	100	.952	.000

This table indicates the correlation between pre and post procedure in cases.

PAIRED SAMPLES TEST

		Paired Differences				
					95% Confidence Interval of the Difference	
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper
Pair 1	HEMOGLOBINPRE – HEMOGLOBINPOST	.04200	.09010	.00901	.02412	.05988

PAIRED SAMPLES TEST

		t	df	Sig. (2-tailed)
Pair 1	HEMOGLOBINPRE – HEMOGLOBINPOST	4.662	99	.000

CURETTAGE

PAIRED SAMPLES STATISTICS

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	HEMOGLOBIN PRE	8.8050	100	.35601	.03560
	HEMOGLOBIN POST	8.6810	100	.38604	.03860

This table indicates the mean hemoglobin pre procedure and post procedure in controls.

PAIRED SAMPLES CORRELATIONS

		N	Correlation	Sig.
Pair 1	HAEMOGLOBIN PRE & HAEMOGLOBIN POST	100	.925	.000

This table indicates the correlation between pre and post procedure in controls.

PAIRED SAMPLES TEST

	Paired Differences				
				95% Confidence Interval of the Difference	
	Mean	Std. Deviation	Std. Error Mean	Lower	Upper
Pair 1 HAEMOGLOBINPRE – HAEMOGLOBINPOST	.12400	.14642	.01464	.09495	.15305

PAIRED SAMPLES TEST

	t	df	Sig. (2-tailed)
Pair 1 HAEMOGLOBIN PRE – HAEMOGLOBIN POST	8.469	99	.000

PAIN SCORE

TABLE 9

MVA/CURE TTAGE	N	Mean	Std. Deviation	Std. Error Mean
pain/VAS 1	100	3.76	1.700	.170
2	100	5.22	1.133	.113

This table compares the pain score in both cases and controls.

INDEPENDENT SAMPLES TEST

	Levene's Test for Equality of Variances		t-test for Equality of Means	
	F	Sig.	t	df
VAS Equal variances assumed	5.842	.017	-7.145	198
Equal variances not assumed			-7.145	172.462

Equal variances assumed	.000	-1.460	.204
pain/VAS			
Equal variances not assumed	.000	-1.460	.204

The P value is .000 which is significant.

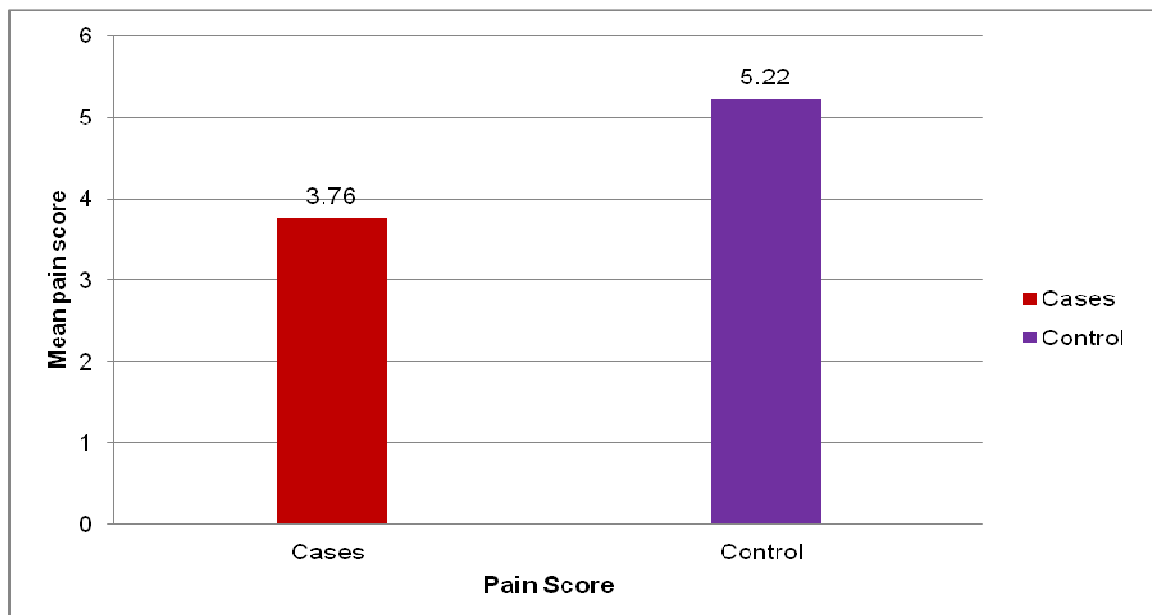
INDEPENDENT SAMPLES TEST

		t-test for Equality of Means	
		95% Confidence Interval of the Difference	
		Lower	Upper
pain/VAS	Equal variances assumed	-1.863	-1.057
	Equal variances not assumed	-1.863	-1.057

TABLE 9

The pain score (according to visual analog scale) is more in controls (5.22) than cases (3.76).

CHART: 9



This bar diagram represents the average pain score in both cases and control.

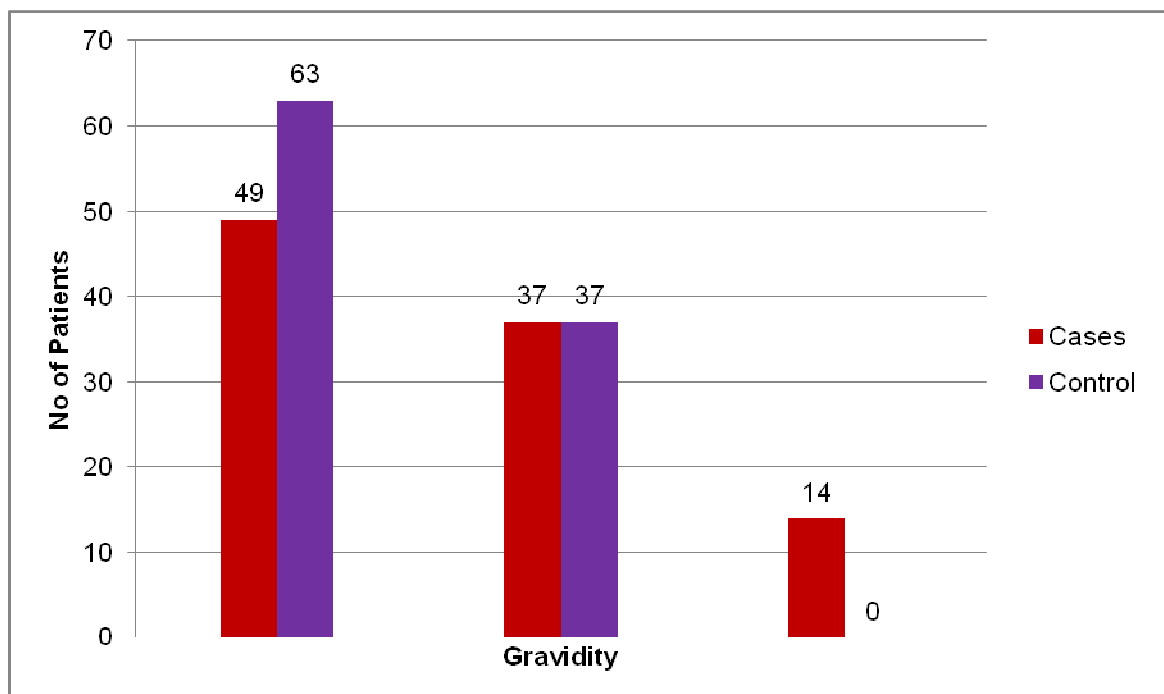
GRAVIDITY

TABLE 10

S.No	Gravidity	Cases	Control
1	Primigravida	49	63
2	Second gravida	37	37
3	Multi gravida	14	0

This tabular column shows the total number of patients in each gravidity index.

CHART 10



This bar diagram represents the distribution of gravidity in cases and control.

7. SUMMARY

In Our study, with a sample size of 100, abortion was induced using MVA in all **CASES** and curettage was the procedure used for **CONTROLS**. The results were compared in terms of anesthesia, procedure, and patient morbidity.

- Out of the 100 patients in cases 89% needed only cervical block compared to controls which is 66%. In cases, 11% needed intravenous anaesthesia compared to the controls that was 34%. The p value is 0.037, which is significant.
- The mean no of pads used by cases were 3.32 compared to controls that used 3.95. The p value is <0.001 which is significant.
- The no of blood transfusion required in cases were 4% compared to controls, which was 12%. The p value is <0.037 which is significant.
- In cases the % of patients who had retained products were 12% compared to controls which constituted around 42%. The p value is <0.000 which is significant.

- The % of patients requiring repeat procedure was 8% in cases compared to controls which were 21%. The p value is < 0.009 which is significant.
- In **cases** 9% of patients needed more than 2 days duration of stay compared to controls 24% .The p value is <0.004 which is significant.
- In controls 12% had cervical laceration compared to cases were none of patient had cervical laceration. The p value is <0.000 which is significant.
- It was observed that there was decrease in hemoglobin after the procedure in cases compared to controls group.
- The average pain score in cases were 3.76 compared to controls which were 5.22.
- There is no difference in age group in both cases and controls.
- The first trimester abortion was more in primigravida in both groups.

8. CONCLUSION

This study done in our hospital compared the efficacy of MVA against the curettage in first trimester incomplete abortion in terms of type of anesthesia needed, procedure done and patient morbidity for one year. The results are

1. Our study showed that, MVA can be done under local **anesthesia** (88%) compared to CURETTAGE which required more of IV anesthesia (34%), also the average **pain score** was less (3.76) when MVA used compared to CURETTAGE (5.22).
2. Our study showed that the **average no of pads** used was 3.32 in patients who underwent MVA, compared to the average no of pads used in patients who underwent curettage which was 3.92 which is comparatively higher. Thus concluding the average amount of blood loss was more when curettage is used for abortion compared to MVA.
3. Our study showed that the need for **blood transfusion** is more when CURETTAGE (12%) is used for attempting abortion compared to MVA (4%).
4. Our study also showed that the number of patients who had **retained products** was less when MVA was used for inducing

abortion compared to curettage and hence the need for repeat procedure was less when MVA is used for inducing abortion.

5. Comparing the complications in both procedure 12% of patients had **cervical laceration** who underwent curettage which was NIL in MVA. Also none of the patients in both procedure had uterine perforation.
6. Our study also showed that the decrease in **hemoglobin** was less when MVA is used as the procedure of choice.
7. The **duration of stay** in the hospital was less when MVA is used for inducing abortion in first trimester, compared to CURETTAGE.
8. Our study also showed that **none** of the groups had uterine **perforation**.
9. Also the **duration of procedure** was found to be same in both the procedures (8-10 min).

Thus concluding that MVA is comparatively better than CURETTAGE in terms of anesthesia, procedure done, and patient morbidity.

9. PROFORMA

Name :

Age:

Occupation:

Social Status:

Address:

Date of admission:

Date of Discharge:

Inpatient number:

History:

Marital History:

Menstrual History:

L.M.P

E.D.D

Obstetric History:

Past History:

Medical :

Diabetes, Hypertension, Renal disease, Cardiac Disease, Asthma, Epilepsy.

Family history:

Personal history:

General examination:

Systemic examination:

Cardio vascular system

Respiratory system

Central nervous system

Abdominal examination

Local examination:

Per speculam examination

Bimanual examination

Pain score

Type of anesthesia:

No of pads used:

No of blood transfused:

If any retained products:

If procedure repeated:

Pre operative Hb level:

Post operative Hb level:

Duration of stay :

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S.No	Name	Gravidity	Age	Anaesthesia	Pain	Blood Loss	Blood Transfusion	Retained Products	Repeat Procedure	Stay in Hospital	cervical laceration	Hb%	
					VAS	Pads / Day						Pre-procedure	post procedure
MVA													
1	Alisha	1	21	cervical block	7	6	yes	yes	yes	>2 days	yes	8.1	7.7
2	Runiri	1	21	cervical block	7	6	yes	yes	yes	>2 days	yes	8	7.8
3	Saroja	3	20	cervical block	7	6	yes	yes	yes	>2 days	yes	8	7.9
4	Kalyani	1	23	cervical block	7	6	yes	yes	yes	>2 days	no	8.2	7.7
5	Jameela	1	22	cervical block	7	6	no	yes	yes	>2 days	no	8.4	8.4
6	Mallar	2	19	IV	7	6	no	yes	yes	>2 days	no	8.4	8.4
7	Sathya	2	21	cervical block	7	6	no	yes	yes	>2 days	no	8.4	8.4
8	Pattu	2	24	cervical block	7	6	no	yes	yes	>2 days	no	8.4	8.4
9	Mary	2	27	cervical block	6	6	no	yes	no	>2 days	no	8.4	8.4
10	Babitra	2	23	cervical block	7	6	no	yes	no	<2 days	no	8.4	8.4
11	Rathra	1	26	IV	6	6	no	yes	no	<2 days	no	8.4	8.4
12	Suraari	1	25	cervical block	7	6	no	yes	no	< 2 days	no	8.3	8.3
13	Divya	1	24	cervical block	7	6	no	yes	no	< 2 days	no	8.3	8.3
14	Chitra	1	21	cervical block	7	5	no	yes	no	< 2 days	no	8.3	8.3
15	Ambika	3	19	cervical block	7	6	no	yes	no	< 2 days	no	8.3	8.3
16	Kala	3	16	cervical block	7	6	no	yes	no	< 2 days	no	8.3	8.3
17	Chellamma	3	18	cervical block	7	6	no	yes	no	< 2 days	no	8.3	8.3
18	Devi	3	19	IV	5	5	no	yes	no	< 2 days	no	8.3	8.3
19	Vinodhini	3	23	cervical block	4	5	no	no	no	< 2 days	no	8.3	8.3
20	Poornima	3	21	cervical block	4	5	no	no	no	< 2 days	no	8.3	8.3
21	Nazeema	3	25	cervical block	4	5	no	no	no	< 2 days	no	8.3	8.3

22	Anjali	2	27	cervical block	4	3	no	no	no	< 2 days	no	8.8	8.7
23	Sastri	1	28	cervical block	4	3	no	no	no	< 2 days	no	8.8	8.7
24	Vimala	1	21	cervical block	4	3	no	no	no	< 2 days	no	8.8	8.7
25	Banumathi	2	22	cervical block	4	3	no	no	no	<2 days	no	8.8	8.7
26	Selvi	3	23	cervical block	4	3	no	no	no	<2 days	no	8.8	8.7
27	Saradha	1	30	cervical block	4	3	no	no	no	<2 days	no	8.8	8.7
28	Amul	2	29	cervical block	4	3	no	no	no	<2 days	no	8.8	8.7
29	Sangeetha	1	21	IV	4	3	no	no	no	<2 days	no	8.8	8.7
30	Rohini	1	22	cervical block	4	3	no	no	no	<2 days	no	8.8	8.7
31	Dhanalakshmi	2	24	cervical block	4	3	no	no	no	<2 days	no	8.8	8.7
32	Victoria	1	24	cervical block	4	3	no	no	no	<2 days	no	8.8	8.7
33	Mumtaz	3	21	cervical block	4	3	no	no	no	<2 days	no	8.8	8.7
34	Moogambigai	2	22	cervical block	4	3	no	no	no	<2 days	no	8.8	8.7
35	Karpargam	2	23	cervical block	4	3	no	no	no	<2 days	no	8.9	9
36	Bhagya	2	24	cervical block	4	3	no	no	no	<2 days	no	8.9	9
37	Shakila	1	25	cervical block	2	3	no	no	no	<2 days	no	8.9	9
38	Seetha	1	28	cervical block	2	3	no	no	no	<2 days	no	8.9	9
39	Elizabeth	2	29	cervical block	2	3	no	no	no	<2 days	no	8.9	8.9
40	Sujama	3	28	IV	2	3	no	no	no	<2 days	no	8.9	8.9
41	Swathi	1	28	cervical block	2	3	no	no	no	<2 days	no	8.9	8.9
42	Ananthi	1	21	cervical block	2	3	no	no	no	<2 days	no	8.9	8.9
43	Rani	2	27	cervical block	2	3	no	no	no	<2 days	no	8.9	8.9
44	Poorna	2	19	cervical block	2	3	no	no	no	<2 days	no	8.9	8.9
45	Sandhya	2	31	cervical block	4	3	no	no	no	<2 days	no	8.9	8.9
46	Madhiya	2	19	cervical block	2	2	no	no	no	<2 days	no	8.9	8.9
47	Rosika	2	21	IV	2	2	no	no	no	<2 days	no	8.9	8.9
48	Sabiya	2	23	cervical block	2	2	no	no	no	<2 days	no	9	8.9

49	Kumudha	1	22	cervical block	2	2	no	no	no	<2 days	no	9	8.9
50	Pushpa	2	30	cervical block	2	2	no	no	no	<2 days	no	9	8.9
51	Lalitha	1	20	cervical block	2	2	no	no	no	<2 days	no	9	8.9
52	Indira	1	20	cervical block	2	2	no	no	no	<2 days	no	9	8.9
53	Faridha	2	21	cervical block	4	2	no	no	no	<2 days	no	9	8.9
54	Diliamma	1	22	cervical block	2	2	no	no	no	<2 days	no	9	8.9
55	Gowri	1	23	IV	2	2	no	no	no	<2 days	no	9	8.9
56	Jamuna	2	24	cervical block	2	2	no	no	no	<2 days	no	9	8.9
57	Varalakshmi	2	25	cervical block	4	2	no	no	no	<2 days	no	9	9
58	Loganayaki	1	26	cervical block	4	2	no	no	no	<2 days	no	9	9
59	Satya	1	21	cervical block	4	2	no	no	no	<2 days	no	9	9
60	Malliga	2	26	cervical block	4	2	no	no	no	<2 days	no	9	9
61	Annamal	1	27	cervical block	2	2	no	no	no	<2 days	no	9	9
62	Esther	2	28	cervical block	2	2	no	no	no	<2 days	no	9	9
63	Karpargam	3	29	cervical block	2	2	no	no	no	<2 days	no	9	9
64	Sumithra	1	21	cervical block	2	2	no	no	no	<2 days	no	9	9
65	Menaka	2	22	cervical block	4	2	no	no	no	<2 days	no	9	9
66	Jyothi	1	23	cervical block	2	2	no	no	no	<2 days	no	9	9
67	Sudha	2	27	cervical block	4	2	no	no	no	<2 days	no	9	9
68	Mala	1	28	cervical block	4	2	no	no	no	<2 days	no	9	9
69	Nirmala	2	31	IV	4	2	no	no	no	<2 days	no	9	9
70	Banu	1	21	cervical block	4	2	no	no	no	<2 days	no	8.4	8.5
71	Kamala	1	22	cervical block	4	2	no	no	no	<2 days	no	8.4	8.5
72	Crystal	2	23	cervical block	4	3	no	no	no	<2 days	no	8.4	8.5
73	Sunitha	1	24	cervical block	4	3	no	no	no	<2 days	no	8.4	8.5
74	Lakshmi	1	25	cervical block	4	3	no	no	no	<2 days	no	8.4	8.5
75	Kokila	1	27	cervical block	4	3	no	no	no	<2 days	no	8.4	8.5

76	Sulochana	1	21	cervical block	4	3	no	no	no	<2 days	no	8.4	8.5
77	Pramila	1	22	cervical block	4	3	no	no	no	<2 days	no	8.4	8.4
78	Malliga	1	23	cervical block	4	3	no	no	no	<2 days	no	8.4	8.4
79	Thilagam	1	24	cervical block	4	3	no	no	no	<2 days	no	8.4	8.4
80	Ranju	1	25	cervical block	4	3	no	no	no	<2 days	no	8.4	8.4
81	Beevi	2	26	cervical block	4	3	no	no	no	<2 days	no	8.4	8.4
82	Saroja	1	19	IV	4	3	no	no	no	<2 days	no	8.7	8.6
83	Deivam	1	20	cervical block	4	3	no	no	no	<2 days	no	8.7	8.6
84	Sumathy	1	21	cervical block	4	3	no	no	no	<2 days	no	8.7	8.6
85	Noorjahan	1	22	cervical block	4	3	no	no	no	<2 days	no	8.7	8.6
86	Vennilla	3	21	cervical block	4	3	no	no	no	<2 days	no	8.7	8.6
87	Kartika	3	29	cervical block	2	3	no	no	no	<2 days	no	8.7	8.6
88	Bhavani	2	26	cervical block	2	3	no	no	no	<2 days	no	8.7	8.6
89	Gayathri	2	25	cervical block	2	3	no	no	no	<2 days	no	8.7	8.6
90	Amala	1	24	cervical block	2	3	no	no	no	<2 days	no	8.7	8.6
91	Amudha	2	21	IV	2	3	no	no	no	<2 days	no	8.7	8.6
92	Nalini	1	22	cervical block	2	3	no	no	no	<2 days	no	8.7	8.6
93	Anitha	1	23	cervical block	2	3	no	no	no	<2 days	no	8.7	8.6
94	Valli	1	24	cervical block	2	3	no	no	no	<2 days	no	8.7	8.6
95	Nithya	1	25	cervical block	2	3	no	no	no	<2 days	no	8.7	8.6
96	Prema	1	26	cervical block	2	3	no	no	no	<2 days	no	8.7	8.6
97	Anjammal	2	27	cervical block	2	3	no	no	no	<2 days	no	8.7	8.6
98	Meena	2	28	cervical block	2	3	no	no	no	<2 days	no	8.7	8.6
99	Sharmila	2	29	cervical block	2	3	no	no	no	<2 days	no	8.7	8.6
100	Princy	2	30	IV	2	3	no		no	<2 days	no	8.7	8.6

CURETTAGE													
101	Sangu Lakshmi	1	20	IV	4	5	yes	yes	yes	>2 days	yes	8.1	7.9
102	Poornima	1	21	cervical block	4	5	yes	yes	yes	>2 days	yes	8.1	7.8
103	Vimala	2	22	cervical block	2	5	yes	yes	yes	>2 days	yes	8	7.8
104	Salma	1	23	cervical block	2	5	yes	yes	yes	>2 days	yes	8	7.9
105	Yasmin	1	24	IV	4	5	yes	yes	yes	>2 days	yes	8	7.5
106	Sangeetha	2	26	cervical block	4	5	yes	yes	yes	>2 days	yes	8	7.5
107	Kanchana	1	27	cervical block	2	5	yes	yes	yes	>2 days	yes	8.1	7.9
108	Dorathy	1	25	IV	4	5	yes	yes	yes	>2 days	yes	8.1	7.9
109	Afrin	2	24	cervical block	2	5	yes	yes	yes	>2 days	yes	8.1	7.9
110	Banu Priya	1	22	cervical block	4	5	yes	yes	yes	>2 days	yes	8.2	7.8
111	Saranya	2	21	IV	4	5	yes	yes	yes	>2 days	yes	8.1	7.8
112	Neelavathy	1	24	cervical block	4	5	yes	yes	yes	>2 days	yes	8	7.8
113	Malathy	2	25	IV	4	5	no	yes	yes	>2 days	no	8.5	8.6
114	Kamatchi	1	26	cervical block	4	6	no	yes	yes	>2 days	no	8.5	8.6
115	Renuka Devi	2	27	cervical block	4	6	no	yes	yes	>2 days	no	8.5	8.6
116	Kamatchi	1	28	cervical block	4	6	no	yes	yes	>2 days	no	8.5	8.5
117	Suriya	2	29	cervical block	4	6	no	yes	yes	>2 days	no	8.5	8.5
118	Maha Lakshmi	1	21	IV	4	6	no	yes	yes	>2 days	no	8.5	8.5
119	Parimala	2	20	cervical block	4	6	no	yes	yes	>2 days	no	8.5	8.4
120	Anjalai	1	20	cervical block	4	6	no	yes	yes	>2 days	no	8.6	8.4
121	Flora	1	20	cervical block	4	6	no	yes	yes	>2 days	no	8.6	8.4
122	Kalaivani	1	21	cervical block	4	6	no	yes	no	>2 days	no	8.6	8.4
123	Chitra	1	22	cervical block	4	6	no	yes	no	>2 days	no	8.6	8.7
124	Suganya	2	23	IV	4	6	no	yes	no	>2 days	no	8.6	8.7
125	Samundeeswari	1	30	cervical block	4	6	no	yes	no	<2 days	no	8.6	8.6
126	Yamuna	2	21	IV	4	6	no	yes	no	<2 days	no	8.6	8.8

127	Girija	1	22	cervical block	4	6	no	yes	no	<2 days	no	8.6	8.8
128	Kokila Priya	2	22	cervical block	4	6	no	yes	no	<2 days	no	8.6	8.8
129	Supriya	1	21	cervical block	4	6	no	yes	no	<2 days	no	8.6	8.5
130	Vinodha	1	25	cervical block	4	6	no	yes	no	<2 days	no	8.6	8.5
131	Deviga	2	23	IV	4	6	no	yes	no	<2 days	no	8.6	8.5
132	Leela	1	21	cervical block	4	6	no	yes	no	<2 days	no	8.8	8.7
133	Nadhiya	2	23	cervical block	4	6	no	yes	no	<2 days	no	8.8	8.7
134	Sakthi Priya	1	24	cervical block	4	6	no	yes	no	<2 days	no	8.8	8.7
135	Nandhini	1	25	IV	4	3	no	yes	no	<2 days	no	8.8	8.7
136	Geetha	2	26	IV	6	3	no	yes	no	<2 days	no	8.8	8.7
137	Prashathi	2	23	IV	6	3	no	yes	no	<2 days	no	8.8	8.7
138	Selvi Saravanan	1	22	IV	6	3	no	yes	no	<2 days	no	8.8	8.7
139	Muthu Lakshmi	1	21	cervical block	6	3	no	yes	no	<2 days	no	8.8	8.7
140	Mohana Krishni	1	21	cervical block	6	3	no	yes	no	<2 days	no	8.8	8.7
141	Shreema	1	22	cervical block	6	3	no	yes	no	<2 days	no	8.8	8.7
142	Lakshmi	1	21	IV	6	3	no	yes	no	<2 days	no	8.8	8.7
143	Suji	1	22	cervical block	6	3	no	no	no	<2 days	no	8.8	8.7
144	Varalakshmi	1	24	cervical block	6	3	no	no	no	<2 days	no	8.8	8.7
145	Akila	2	23	IV	6	3	no	no	no	<2 days	no	8.8	8.7
146	Kala	1	25	IV	6	3	no	no	no	<2 days	no	8.8	8.7
147	Ramya	2	26	IV	6	3	no	no	no	<2 days	no	8.9	8.7
148	Ruma Biswas	1	27	cervical block	6	3	no	no	no	<2 days	no	8.9	8.7
149	Devi	2	22	cervical block	6	3	no	no	no	<2 days	no	8.9	9
150	Kalaivani	2	21	cervical block	6	3	no	no	no	<2 days	no	8.9	9
151	Mahalakshmi	1	20	cervical block	6	4	no	no	no	<2 days	no	8.9	9
152	Jotheeswari	1	21	cervical block	6	4	no	no	no	<2 days	no	8.9	9
153	Devi	1	21	IV	6	4	no	no	no	<2 days	no	8.9	8.6

154	Esther Mary	1	21	cervical block	6	4	no	no	no	<2 days	no	8.9	8.6
155	Premavathy	1	20	cervical block	6	4	no	no	no	<2 days	no	8.9	8.6
156	Jeenath Nisha	1	19	IV	6	4	no	no	no	<2 days	no	8.9	9
157	Kamala	1	23	IV	6	4	no	no	no	<2 days	no	8.9	9
158	Lalitha Kumari	1	24	cervical block	6	3	no	no	no	<2 days	no	8.9	9
159	Swaytha	1	25	cervical block	6	3	no	no	no	<2 days	no	8.9	9.1
160	Sarala	1	21	cervical block	6	3	no	no	no	<2 days	no	9.2	9
161	Devi Bala	1	22	IV	6	3	no	no	no	<2 days	no	9.2	9
162	Kalai Arasi	1	19	cervical block	6	3	no	no	no	<2 days	no	9.2	9
163	Kalaichelvi	2	23	cervical block	6	3	no	no	no	<2 days	no	9.2	9
164	Kaliammal	2	22	cervical block	6	3	no	no	no	<2 days	no	9.2	9
165	Anita	2	21	cervical block	6	3	no	no	no	<2 days	no	9.2	9
166	Sridevi	1	24	IV	6	3	no	no	no	<2 days	no	9.2	9
167	Gomathi	1	25	cervical block	6	3	no	no	no	<2 days	no	9.2	9.1
168	Ramya Chitra	2	26	cervical block	6	3	no	no	no	<2 days	no	9.1	9.1
169	Deepa	1	29	IV	6	3	no	no	no	<2 days	no	9.1	9.1
170	Subhashini	2	21	cervical block	6	3	no	no	no	<2 days	no	9.1	9.1
171	Damayanthi	1	20	IV	6	3	no	no	no	<2 days	no	9.1	9.1
172	Thilaka	2	21	IV	6	3	no	no	no	<2 days	no	9.1	9.1
173	Dhivya	1	22	cervical block	6	3	no	no	no	<2 days	no	9.1	8.8
174	Manju	2	23	cervical block	6	3	no	no	no	<2 days	no	9.1	8.8
175	Madhu	1	24	cervical block	6	3	no	no	no	<2 days	no	9.1	8.8
176	Vasanth	2	25	cervical block	6	3	no	no	no	<2 days	no	9.1	8.8
177	Rajammal	1	22	cervical block	6	3	no	no	no	<2 days	no	9.1	9
178	Kokila	2	21	IV	6	3	no	no	no	<2 days	no	9.3	9
179	Kanmani	1	22	IV	6	3	no	no	no	<2 days	no	9.3	9
180	Nilambari	2	23	IV	6	3	no	no	no	<2 days	no	9.3	9

181	Muthu Kumari	1	24	cervical block	6	4	no	no	no	<2 days	no	9.3	9.1
182	Muthathal	2	25	cervical block	6	3	no	no	no	<2 days	no	9.3	9.1
183	Jainirmala	1	26	cervical block	6	2	no	no	no	<2 days	no	9.3	9.1
184	Asha	2	22	IV	6	2	no	no	no	<2 days	no	9.3	9.1
185	Shameem	1	21	IV	6	3	no	no	no	<2 days	no	9.3	9.1
186	Fathima	2	22	cervical block	6	3	no	no	no	<2 days	no	9.3	9.1
187	Aisha Behgam	1	21	cervical block	6	3	no	no	no	<2 days	no	9.3	9.1
188	Saritha	2	20	IV	6	3	no	no	no	<2 days	no	8.9	8.8
189	Shanthi	1	25	cervical block	6	3	no	no	no	<2 days	no	8.9	8.8
190	Rajalakshmi	2	27	cervical block	6	3	no	no	no	<2 days	no	8.9	8.8
191	Rajeshwari	1	23	IV	6	3	no	no	no	<2 days	no	8.9	8.7
192	Kirthika	1	22	cervical block	6	3	no	no	no	<2 days	no	8.9	8.7
193	Keerthana	2	28	cervical block	6	3	no	no	no	<2 days	no	8.9	8.7
194	Latha	1	27	IV	6	3	no	no	no	<2 days	no	8.9	8.7
195	Anjali	1	26	cervical block	6	3	no	no	no	<2 days	no	8.9	8.7
196	Preethi	2	21	cervical block	6	3	no	no	no	<2 days	no	8.9	8.8
197	Sanghavi	1	21	IV	6	3	no	no	no	<2 days	no	8.9	8.8
198	Lalitha	2	22	cervical block	6	3	no	no	no	<2 days	no	8.9	8.6
199	Parvathi	1	23	cervical block	6	3	no	no	no	<2 days	no	8.9	8.7
200	Punitha	1	28	cervical block	6	3	no	no	no	<2 days	no	8.9	8.7